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FIG. 1A

OOH

anthraflavic acid

9-anthracene carboxylic acid 2

9-anthracene methanol 3

9-anthracene ethanol

9-anthracene propanol

9-anthracene butanol

NH

primuline

FIG. 1F

SO₃Na

4-methoxyphenylazobenzene-4-carboxy propyl triethoxysilane
41

FIG. 1B

2-hydroxy-4-(3-triethoxysilylpropoxy)diphenylketone 10

2-hydroxy-4-(3-tributoxysilylpropoxy)diphenylketone 12

rosolic acid 14

trimethoxysilylpropyl-1,8-naphthalimide

2-hydroxy-4-(3-trimethoxysilylpropoxy)diphenylketone 11

2-hydroxy-4-(3-tripropoxysilylpropoxy)diphenylketone 13

triethoxysilylpropyl-1,8-naphthalimide 15

tripropoxysilylpropyl-1,8-naphthalimide

.

FIG. 1C

OCH₂Si(OC₂H₅)₃

9-anthracene carboxy-methyl triethoxysilane (TESAC) 18

 $O(C_2H_4)Si(OC_2H_5)_3$

9-anthracene carboxy-ethyl triethoxysilane 19

 $O(C_4H_8)Si(OC_2H_5)_3$

9-anthracene carboxy-butyl triethoxysilane 20

O(C2H4)Si(OC4H9)3

O(C₃H₆)Si(OC₂H₅)₃

O(CH₂)Si(OCH₃)₃

triethoxysilane (TESAC) 21

9-anthracene carboxy-propyl 9-anthracene carboxy-methyl trimethoxysilane 22

9-anthracene carboxy-ethyl tributoxysilane 23

 $O(CH_2)Si(OC_3H_7)_3$

O(C₃H₆)Si(OCH₃)₃

Si(OC₂H₅)₃

tripropoxysilane 24

9-anthracene carboxy-methyl 9-anthracene carboxy-methyl trimethoxysilane 25

phenyltriethoxysilane 26

Si(OCH₃)₃

phenyltrimethoxysilane 27

Si(OC₃H₇)₃

phenyltripropoxysilane 28

Si(OC₃H₇)₃

phenyltriethoxysilane 29

FIG. 1D

10-phenanthrene carboxy-methyl triethoxysilane 29

10-phenanthrene carboxy-ethyl triethoxysilane 30

10-phenanthrene carboxy-methyl trimethoxysilane 31

10-phenanthrene carboxy-propyl triethoxysilane 32

4-phenylazophenol 33

4-ethoxyphenylazobenzene-4-carboxy methyl triethoxysilane 34

$$\begin{array}{c} O \\ \text{H}_3\text{CO} & \stackrel{\bigcirc}{\longrightarrow} & \stackrel{\bigcirc}{\text{C}} - O(C_2\text{H}_4)\text{Si}(OC_2\text{H}_5)_3 \end{array}$$

4-methoxyphenylazobenzene-4-carboxy ethyl triethoxysilane

FIG. 1E

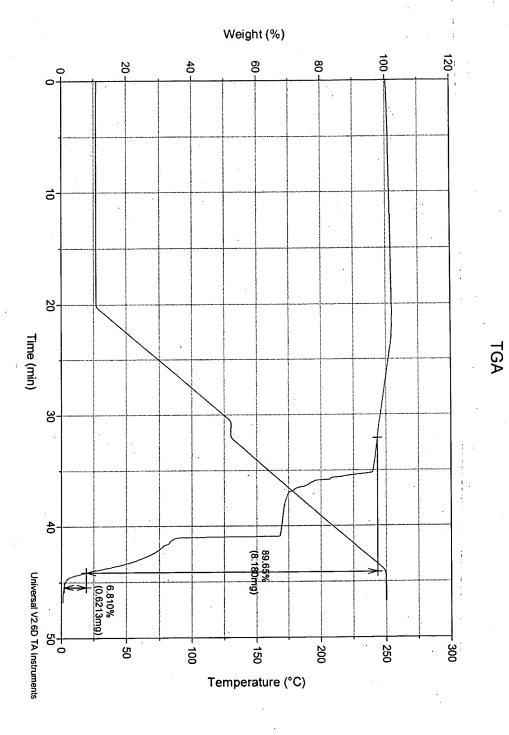
4-ethoxyphenylazobenzene-4-carboxy propyl triethoxysilane 36

4butoxyphenylazobenzene-4-carboxy propyl triethoxysilane 37

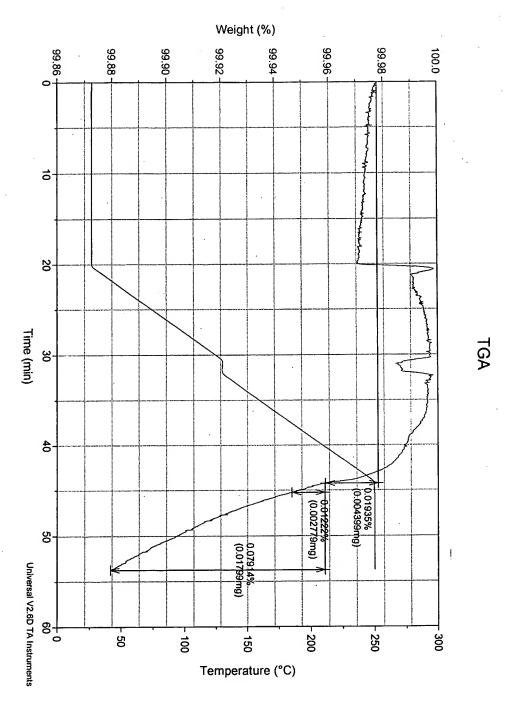
4-methoxyphenylazobenzene-4-carboxy methyl triethoxysilane 38

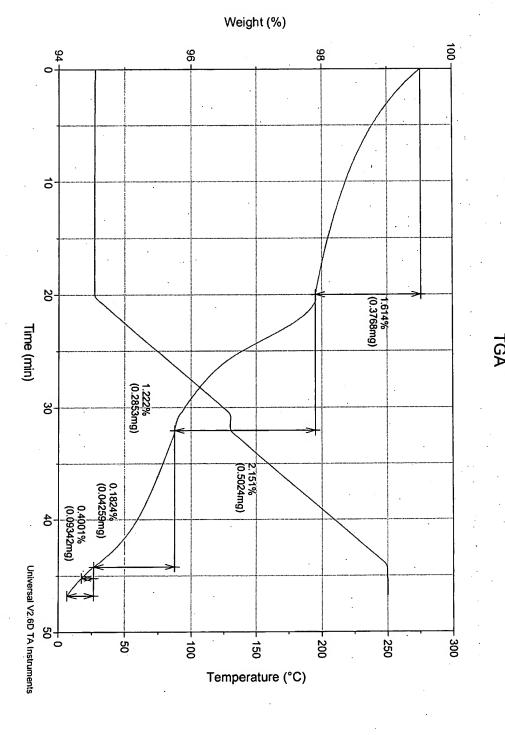
4-ethoxyphenylazobenzene-4-carboxy methyl triethoxysilane 39

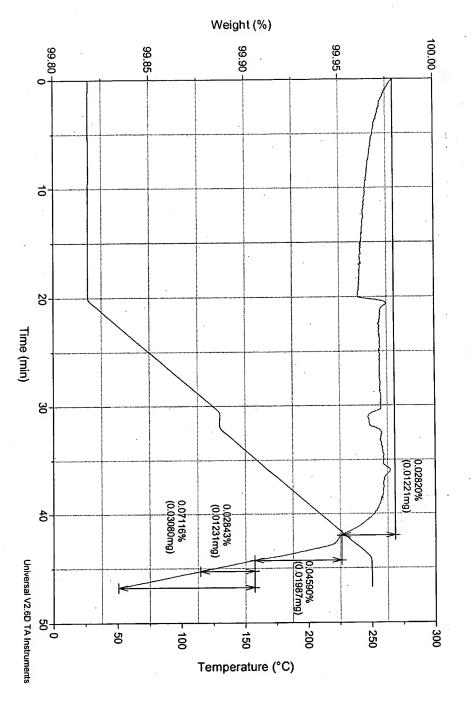
4-methoxyphenylazobenzene-4-carboxy ethyl triethoxysilane



HIGHT 1







TGA

1999 1999
193 193
1973 1973
Ye. Corresortal (193 Absarta 192 Absarta
Corregare (475 Absorb (196 Absorb) (496 Absorb)
193Absarb. 1945Absarb. 1945Abbarb. 1944Abbarb.
Cont. 1972 Absorb. 1973 Absor
1975 Absatb 1975 Absorta 1975 Ar South 1975 Absatb 1970 ppm triflate 1970
198 Absorta 193 Appm
383ppm triflate triflate 130/2 130/2 3543 3563 33469

:		248 Absorbing Comp.	èui 6ui	Absorb Comp.	beorbing Jomp.	193 Abs	93 Absorb. Comp.	193 A	193 Absorb. Comp.	(93 Absorb. Comp	sarb.	193 Absorb. Comp.	sare. P.
Desc	Description	44.			Rev C	APTEO:	f1070ppm APTEOS triflate	APTE0	+1070ppm APTEOS triflate	+1070pc APTEOS triflate	+1070ppm)S triflate	+1070pp APTEOS triflate + 1.5%DPG	+1070ppm striffate + DPG
12.	Hd	Z	NYA	₹	-	v	2	V	₹	\	-	\	
Dake C	Bake Sedilence	130/	130/200 C	130/1	130/160 C	130/1	130/160 C	130/2	130/200 C	130/2	130/240 C	130/200 C	30 C
	22112252	09	50 sec)6	80s				
500:1	1 min @	Pre	ER	Pre	ER	Pre	ER	Pre	띪	Pre	R	Pre	띪
BOE	ີ 20 °C	. 3633	[873]	1676	- 268	2741	[860]	2724	[1/07/1]	2737	[1026]	3211	[1632]
TMAH	1 min @	Pre	ER	Pre	ER	Pre	ER	Pre	ER	Pre	ER	Pre	H
,00	ີ 23 °C	3527	E.	1690	(0)	2720	٩	2747	(2)	2710	8	3172	3 5
2.3% aq.	၁ _, 09	3524	572	1676		2722	'চ	2729		2713		3199	[202]
7	∴75°C	3540	(1668)	1676	- 3B	2743	12Th	2743	ST.	2692	Ō	. 3181	DOM:
N. W. W. W. W.	20.86	3534	- raen	1681	© .	2701	16	2722	(36)	2700	N.	3479	[K30]
5.0% aq.	ີ ບູ _ຍ 09	3543	18878×3*	1676	Ö	2709	8	2717	8	2705	· 69/	3183	58/88
E E	್ರಿ 92	3527	11.4534	1687	9	2715	272	2713	192	2671	150	3166	:0163 :
MARKET TO SERVE A		STREET, STREET	WENNERS TO SERVICE	MALINEA MENERAL	98.00	A COMPANY OF A STATE OF	A CAMPANA	#7#CB#G	DOM: NOT	THE STATES	A CANADA	NA ALCOHOLOGY	F
20000	∵23 °C	6898	: 2000 300 ·	1690		2734		2741	(S)	2716	\$35.00 m	3201	[6.30]
10.0% aq.	ວ, 09	3532	25.55	1682	(A)	2736	259	2749	224	2731	168	3173	SAITA
	_75 °C	3533	- >3086] 	1674	*109	2701	515	2726	518	2731	394	3186	55005

		193 Absorb.	orb.	193 Abs	Absorb.	193 A	193 Absorb.	1431	193 Absorb.	193 Absovb.	bsovb.	193	193 Absorb
Desc	Description	APTEOS	+1070ppm APTEOS triflate + 1.5%DPG	+1070ppm triflate +	+1070ppm APTEOS triflate + 3%DPG	+1070ppr triflate +	+1070ppm APTEOS triflate + 3%DPG	170 Ammonii	170ppm Ammonium Triflate	170ppm Ammonium Triflate + 3% D	170ppm Ammonium Friflate + 3% DPG	170ppm Ammonium Triflate + 3% DPG	+ pm nium 3% DPG
	Hd	V	₹	\			₹		₽	₹	_	₹	
Boke S	Section Control	130/	130/240 C	130/2	30/200 C	130/	130/240 C	130	130/200 C	130/200 C	00 C	130/240 C	200
D P P P P P P P P P P P P P P P P P P P							90s						
500:1	1 min @	Pre	ER	Pre	ER	Pre	H.	Pre	ER	Pre	ER	Pre	H.
BOE	ີ 20°C∵	3214	[6/62]	2098		3548	[f]0659]	2751	· (OVACI)	2971	ोताड्यम्।	2982	(हिंदिहा)
TMAH	1 min @	Pre	ER	Pre	ER	Pre	ER	Pre	ER	Pre	ER	Pre	ER
7000	_23°C=	3218	123	3523	E	3564	(Q)()	2732	(3)	2951	3	2972	30
4.3% aq. TMAH	ე _ი 09	3184	(40)00	3510	0)(2)%	3529	(C)(C)(C)	2746	. (SA)	2997	655	2960	.421
	75°℃;	3202	X67023	3505	>6006	3519	365K	2736	325	2977	1000%	2992	150.7% 150.7%
	10000	3404	900	7532	MAGES.	35.40	LCO/J	A11.0		00.00	100 CO 10	ALC: NO DESCRIPTION OF THE PERSON OF THE PER	6 - 3 C
5.0% aq.	20°C	3175	20103	3505		3479	2/25/E	2725	25.4	2167	awayu	7927	
TMAH	78.00	3165	SEULES :	3005	Seviers	3487		2750	, , , , , , , , , , , , , , , , , , ,	2073		2000	
		A	1000	200		2010		27.7	000	6313		7222	2/24/030)
40.00		3200	[592]	3563	[65263]	3496	(10/40)	2702	124	2979	st lout	2949	455
TMAH TMAH	್ರಿ 09	3176	: 56ATAG	3504	×€50M	3496	8078%	2761	619	2983	03807%	2949	(3)(3)(3)
	.75°C	3187	\$5KE7	3534	S8381	3500	SSECTION	2766	991	2986	9567	2992	2000E

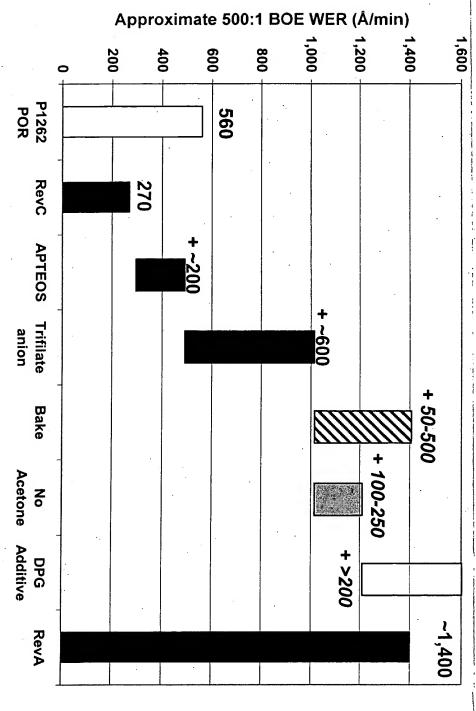
		248 A	248 Absorb. Compos.	193 Abs. Comp.	हैं है	193 Abso	193 Absorb. Comp.	193.0456 Comp.	192.Absorb. Comp.	193 Ab	193 Absorb. Comp	193 Abs.	785. P	1931	193 Absorts. Comp.
Description	ption			+1070ppm AF Triflate + 0.59	+1070ppm APTEOS Triflate + 0.5% DPG	*1070ppi APTEOS Triflate + 1.5% DPG	r1070ppm Triflate + DPG	1070pm "optimized" APTEOS Triflate	+ 1070ppm "optimized" TEOS Triflate + 0.25% DPG	.+ 1070ppm "optimized" APTEOS Triflate 0.5% DPG	+	+ 1070ppm "optimized" APTEOS Triflate + 1% DPG		"optimizec Triflate +	+ 1070ppm "optimized" APTEOS Triflate + 1.5% DPG
Hd	_	2	N/A	ľ	⊽	₹		Y	\$	V	4	42	2	•	<2
200		130/	130/200 C	130/200	2 OC	130/200 C	o e	130%	30/200 C	130/200 C		130/2	130/200 C	130/	130/200 C
Dake Sednence	aguanb	20	. oas 05		06	on sec					06	on sec			
500:1	1 min @	Pre	Æ	Pre	띪	Pre	ER	Pre	ER	Pre	ER	Pre	ER	Pre	ER
BOE	ွ ့	3487		2869	[[[403]]	3177	[[(60]]]	2879	*[regi]	2902	1[[603]]	2907	-[iJestii]-	2947	(((850)
TMAH	1 min @	Pre	ER	Pre	æ	Pre	FR	Pre	ER	Pre	R	Pre	ER	Pre	FR
	್ 23 °C	3492	127	2847	@	3190	8	7824	***	2934	(B)	2957	(F3)	2960	8
2.3% aq.	ာ အ	3463	723	2886	88	3190	. (603)	2893	279	2887	447	2955	798	2958	735
_	75°C	3494	(E37)	2875	198	3203	355705	2864		2885	SYTTE	2987	100000 1000000	2984	[] SASBELL
	2006	3075	IR121	2893	(8)	3187	ě	2853	38	2898	300	7000	158	3038	259
) ရှင် ရ	3520	03533	2857	356	3189	(33)(5%	2844	739	2910	(1003)	2932	#1(696)1#s	2973	
	75°C	3506	and in	2858	Friceon	3184	×3(8K)	2850	Search .	2926	55556	2926	97673	3006	55(003)
A 400		Š	200		771 28	A	-			P. D (2). 18		3 57 25		6.00 - 2.5.5. v 0	
40.00/	33°C	3499	25,702	2877	්සි	3187	72.15	2871	715	2967	[[E37]]	2977	8877	2862	
TMAH	ິ20 ₀C	3522	\$830	2848	(1009)	3215	855	2899	# (GEE)/\$	2906	90000	2942	2000	2958	. Sec. 13
	ે. 75 °C	3542	.d/583	2851	15353	3186	25)(63)	2885	\$2383	2897	0.553	2991	16533	2976	- 5 <u>7</u> 5076

Absorb Comp. + Ammoniur + 0.25%	Absorbing Comp. + 170ppm Ammonium Triflate + 0.25% DPG	Absorb. Comp. + 170ppm Ammonium Triflate + 0.5% DPG		465016. Comp. 170ppm Ammonium Triffate	P. 6.	193 Absorb. Comp. 383ppm TMAH- MSA	76. TMAH-	465076. Comp. Comp. * + + 383ppm TMAH- MSA + 1.5% DPG	± 50 €	193 465076. Comp 1070ppm APTEOS-MSA	43 50mb 1070ppm TEOS-MSA	Absorb. Comp. 1070ppm APTEOS-MSA+	7. 6
4		. 8		8	5 0	8		\$		V	8	2	5 2
ΙĀ	130/200 C	130/200 C) C	130/200 C) 2 8	130/200 C	J 98	130/200 C	ာ ၁	130/2	130/200 C	130/2	130/200 C
		oes 06					oas 06	ລູ		22.0	806	90 sec	
	8	Pre	ER	Pre	Æ	Pre	H	Pre	E	Pre	띪	Pre	品
****	[[7,102]]	2830	[11/149]	2931	[[283]]	2823	723	2816	895	2768	335	2839	1086
\vdash	ER	Pre	띪	Pre	ER	Pre	띪	Pre	ER	Pre	ER	Pre	띪
El Santal		2821		2924	S.	2812	Ó	2828	0	2777	(40)	2834	83
all Sale Agency		2835	120	2881	201	2769		2810		2765		2831	3
	415	2854	678	2897	1132	2755	123	2848	293	2794	209	2812	507
23	2.00		10000	0000	11000		2 7 7 7						
1	67.7	2841		2883		2//3		2811		2821		2868	
	206	2871	278	2903	464	2797		2852	4	2763		2871	115
1	586	2843	867	2937	+1827	2779	191	2824	457	2804	283	2848	695
	102	2840	138	2885	223	2770	£ 00-3	2827	100	2806	34.6	2811	8
	605	2818	77.5	2914	1533	2843	(84)	2790	840	2792	610	2863	387
	4.1100	2846	11690	2878	#[2878] -	2799	441	2793	- 849	2777	- 589	. 2847	(16/15)

Table 8

		193 Absorto. Compos.	ું છે	193 Absorb. Comp.		193 Absorb. Comp.	ċ.	193 Absort	,	193 Absorb. Comp.		193 Absorb. Comp.		Absorb. Comp.	. .
Desci	Description	2140ppm "optimized" APTEOS triflate + 0.16% DPG	+ ppm iized" triflate + DPG	2140ppm "optimized" APTEOS triflate 0.25% DPG	+	+ 170ppm "optimized" Ammonium triflate + 0.75% DPG		+ 170ppr "optimized" Ammonium triflate 1% DPG	F +	+ 225ppm "optimized" Ammonium triflate + 0.75% DPG		+ 225ppm "optimized" Ammonium triflate + 1% DPG		+ 340ppm "optimized" Ammonium triflate + 1% DPG	-340ppm ized" n triflate +
_	돐	Q	2	\$		\$		\$		8		4	C	4	
Rake Sc	Rake Sections	130/2	130/200 C	130/200 C	၁၀	130/200 C	၁င	130/200 C	20	130/200 C	00	130/200 C) @	130/200 C	20
	221224		90 sec	ວອ	- -		oes 06	28			oes 06	ec		oes 06	J
500:1	1 min @	Pre	띪	Pre	R	Pre	ER	Pre	띪	Pre	똢	Pre	#	Pre	8
B0E	.20°C	2970	[0.000]	2933) (089) e	2933	ીલહાઇ)	2696	* locivit	2902	[[(2772]]	2938	S[nerd]	2970	[(1839]
TMAH	1 min @	Pre	R	Pre	ER	Pre	ER	Pre	ER	Pre	ER	Pre	Æ	Pre	띪
7000	್ 23 °C	2995	78)	2962	. SQ	2905		2913	S.	2920	101	2936	8	2949	8
TMAH	့ ၁	2965	248	2947	195	2929	17.1	2929	211	2908	167	2932	220	2951	215
	.75 °C	2970	[(Jeos)]:	2946	(1168)	2914	10633	2959	(K20)	2941	(10311)		(1500)	2998	(1533
	23 °C	9	137	2932	103	2905	37	2924	(0)6	2936	5	2979	133	2960	105
5.0% aq.	ဒို		591	2942	462	2915	405	2914	486	2923	412	2980	567	2991	548
7	76 ℃		[2608]	2983	(15661)	2948	1398	2932	[2(198]		4 [1684]	2940	[2/66]		S2.7K)
A STATE OF THE STA	SA AND	Š	f					A Property of		AND SECTION		27 K		SAMPLE OF	
10.0%	အပ	2982	186	2937	147	2915	83	2944	124	2919	124	7367	111	2989	189
TMAH	ွင့	3012	(16)(G	2950	WED.	2934	(320)	2978	(1971)	2909	0,000	2908	(633)	3008	0.4506
	_75°C	2966	25000	2971	SEETA	2879	24:310	2923	S-200-KS	2932	(A):7/3	2937	25.50	2972	550TB

										* annell market	total Barr						of war Twee
143 Absorb. Comp.	+ 1600ppm "optimized" APTEOS triflate + 0.25% DPG	8	130/200 C		Pre ER	2984 [F[[565]]	Pre ER	2944 (3)	2960 266	2987 (T(1864))		7300	2987 640	2981 1 [2620]	2 3 20 222	2950 1777	2960 >2990
:	+ 1600ppm 'optimized" APTEOS triflate + 0.16% DPG AF	8	130/200 C	90 sec	띪	[1450]	ER		249	(189 <u>6)</u>			487	* [(672]]	158		11000
193 Absorb. Comp.	"optimizee triflate + 0		130/	906	Pre	2910	Pre	2909	2984	2925		580# 580#	2931	2962	2947	2918	2967
193 Absorb. Comp.	+ 1600ppm "optimized" APTEOS triflate + 0.08% DPG	4	130/200 C		ER	113211			100 CAL 200	893			7 410	1198	5 115	4 934	9 \$12267
₽\$.	l'optimi trifate				i Pre	7884	l Pre	2919	2906	2885		0)87	1188	2907	2865	2894	2879
्रहरू इ.स.	+ 1070ppm "optimized" APTEOS triflate + 0.25% DPG	8	130/200 C		H	[1450]	ER		242	. 1506		3	588	[2604]	226	319	>2930
193 Absorb. Comp.	107 "opti APTEO 0.26		130		Pre	2974	Pre	3956	2933	2982	77.00	1467	2970	2927	2956	2977	2939
976. P.	1070ppm "optimized" APTEOS triflate + 0.16% DPG	\$	130/200 C		띪	[11467]	쫎		175		A CONTRACTOR		456	1.1612	156		
193 Absorb Comp.	107 "opti APTEO		£	90sec	Pre	2942	Pre	2921	2962	2916	0000	P\$ 27	2902	2941	2917	2936	2914
13 b5076. omp.	+1070ppm "optimized" APTEOS triflate +0.08% DPG	2	130/200 C	- 306	쫎	[1356]	ER	9	142	833	107	5	339	4/1/24	132	851	PARM
193 Absorb Comp.	optimized triflate + 0	· V	1307		Pre	2900	Pre	2885	2894	2926	7,000	IJN67	2874	2912	2892	2870	7886
193 Absorb. Comp.	1070ppm "optimized" APTEOS triflate + 0% DPG	8	30/200 C		Ж	[[1384]]	ER		105	622			256	789	1367	704	SULTED IN
€\$2	1070 "optir APTEOS	Ľ	130/		Pre	2887	Pre	2856	2858	2902	7000	1097	2848	2893	7850	2882	2893
۔ ف		NIA	130/200 C	SO sec	ER	[tioi3]	ER	781	803	4[266]	9040		6698	35-35-66	35555	(100) ×	\$1.5
248 Absorb. Comp.		Z	1307	S	Pre	3265	Pre	3544	3561	3598	7447	2005	3539	3565	3563	3580	3545
	noitq	_	900	מתפוונים	1 min @	20 °C	1 min @	ე, £ 7	၁ _၈ ၀၄	−75 °C	- 0	್ 23 .೮	၁,09	75°C	23 ℃	ე, 09	78°C
	Description	돐	Dake Codillering	S avec	500:1	B0E	TMAH	7000	2.3% aq.		į	F 70% 34	TMAH		7000	TMAH	Š



		25	193	<u> </u>	<i>1</i> 83	<i>3</i>
		Absorb. Composition	Absorb. Comp.	Absorb. Composition	Absorb. Comp.	Absorb. Comp.
Descriptions			+ 1070ppm APTEOS tosylate	+ 1070ppm APTEOS tosylate	+ 1070ppm APTEOS tosylate + 5% DPG	+ 1070ppm APTEOS tosylate + 5% DPG
Hd		1.5	<1	<1.	<1	⊽
Bake temp. (C)/Time (Sec)	(Sec)	150/250C 50sec	130/200C 90sec	130/240C 90sec	130/200C 90sec	130/240C 90sec
Metrics		ER (A/min)	ER (A/min)	ER (A/min)	ER (A/min)	ER (A/min)
0070 € 114 MET 707 0	1 min	210	12	10	23	8
2.5% IMAH @ 21 C	2 min	167	12		42	10
	30 sec	1224	1440	[880]	[2405]	* [1799]
500:1BOE @ 21°C	1 min	1000	>1215	845	×>1309	>1255
	2 min	[880]	£29<	689<	959<	>652
				The state of the s		
ER	ER: Etch Rate (A/min);	e (A/min);				
Pre:	Pre-Imme	Pre: Pre-Immersion SOG Film Average Thickness in Angstrom;	ness in Angstrom;			
A CONTRACTOR OF THE PROPERTY O	ER > 1000A/min.	0A/min.				
A STANSFER STANSFER S. S. SANSFER STANSFER STANS	> Bare Si post-etch.	ost-etch.				
	Post-etch	[] Post-etch film is highly non-uniformed.				

193 Absorb. Composition	RevA + flate 383ppm TMAH tosylate	<1	ec 130/240C 90sec	ER (A/min)	9.		689	279	599				*		
193 Atosovb. Compos.	RevA + 383ppm TMAH triflate	<دا	130/240C 90sec	ER (A/min)			696	844	[858]		kness in Angstrom;				
248 Absorb. Composition		N/A	130/200C 50sec	ER (A/min)	210	291	1224	1000	[088]	(A/min);	Pre: Pre-Immersion SOG Film Average Thickness in Angstrom;	JA/min.	JA/min.	ost-etch.	[] Post-etch film is highly non-uniformed.
			(Sec)		1 min	2 min	30 sec	1 min	2 min	ER: Etch Rate (A/	Pre-Imme	ER > 1000A/min.	ER < 1000A/m	Bare Si post-etch.	Post-etch
	Descriptions	Hd	Bake temp. (C)/Time (Sec)	Metrics	0.50 € HAMT %3.0	2.5% IMAH @ 21 C		500:1BOE @ 21°C		ER	Pre:		 A. S. Martin, M. S. Martin, Phys. Lett. B 35, 127 (1997). A. Martin, M. S. Martin, Phys. Lett. B 40, 171 (1997). A. Martin, M. S. Martin, Phys. Lett. B 40, 171 (1997). 	^	

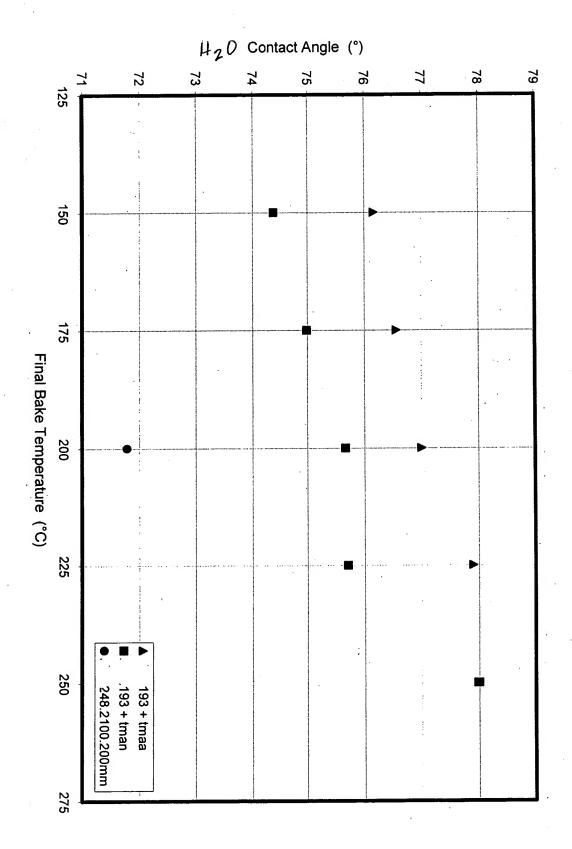
	"N" wt / Si comp. Wt (ppm)	"N" mole / Si comp. Wt (ppm)	"N" mole / Si comp. Wt (ppm) (consider 95% TMAA and 96% TMAN
4S_TMAA	589	4.422	4.201
TMAN	601.2	4.416	4.239

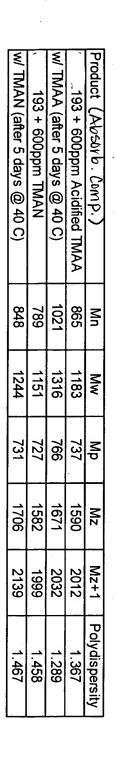
193 Absorbing Composition + TMAA

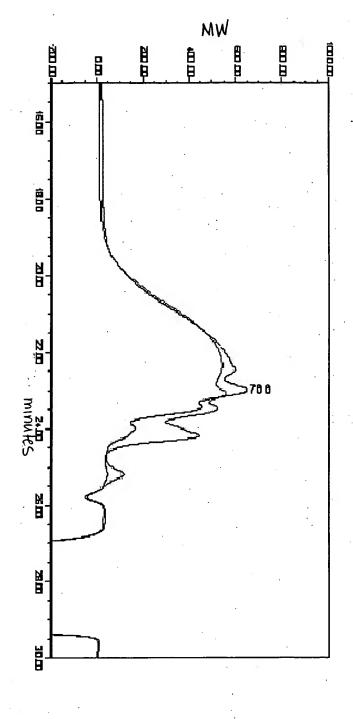
Bake temp. (C)/Time (Sec)	(Sec)	130/150C 90sec	130/175C 90sec	130/200C 90sec	130/225C 90sec	130/250C 90sec
Metrics		ER (A/min)	ER (Amin)	ER (A/min)	ER (A/min)	ER (Almin)
2.5% TMAH @ 21°C 1 min	1 min				2	•
PGMEA @ 21°C	6 min	70	9:0-	0.4	-02	60
T (0 4 0 0 1 0 0 0 1 0 0 0 1 0 0 0 1 0 0 0 1 0 0 0 1 0 0 0 1 0 0 0 1 0 0 0 1 0 0 0 1 0 0 0 0 1 0 0 0 0 1 0 0 0 0 1 0 0 0 0 1 0 0 0 0 1 0 0 0 0 1 0	30 sec	838	251	. 206	165	144
SULTBUE (@ ZI C	1 min	Ве€	273	* # * * 215 * * * * * * * * * * * * * * * * * * *	191	176 -

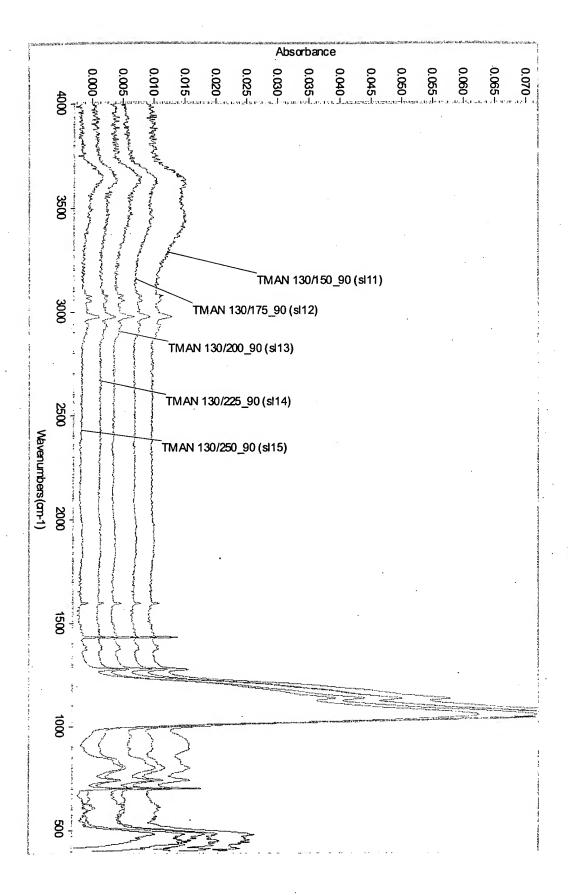
193 Aboor bing Comp. +TMAN

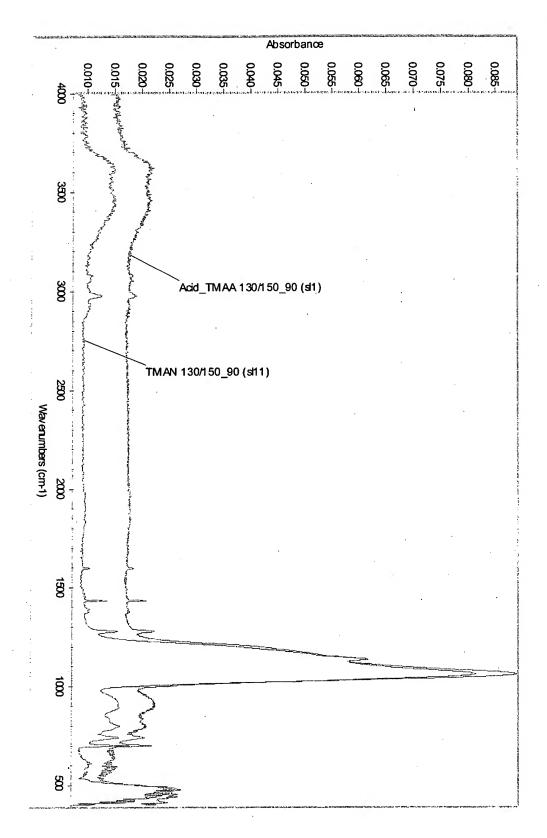
TWO.	10.01		74767	000000			3
Dake temp. (C)/11me (Sec) 130/130C 905ec	(sec)		130/1/5C 90sec	130/200C 90sec	130/225C 90sec	130/250C 90sec	130/200C 60sec
Metrics		ER (A/min)	ER (Almin)	ER (Amin)	ER (Amin)	ER (Amin)	ER (A/min)
2.5% TMAH @ 21°C 1 min	1 min		.		•	•	882、二丁
PGMEA @ 21°C	6 min	20	-0.2	7.0	10	\' 0	21
T (0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	30 sec	574	403	261	238	186	1/140 = 1
SUUTIBUE (@ ZI C	1 min	562	413	312	244	198	÷ 1 ± 1886
		Spin Coated @ 7	@ 7PM on 5/22	³ M on 5/22/03; Wet Process	S .		

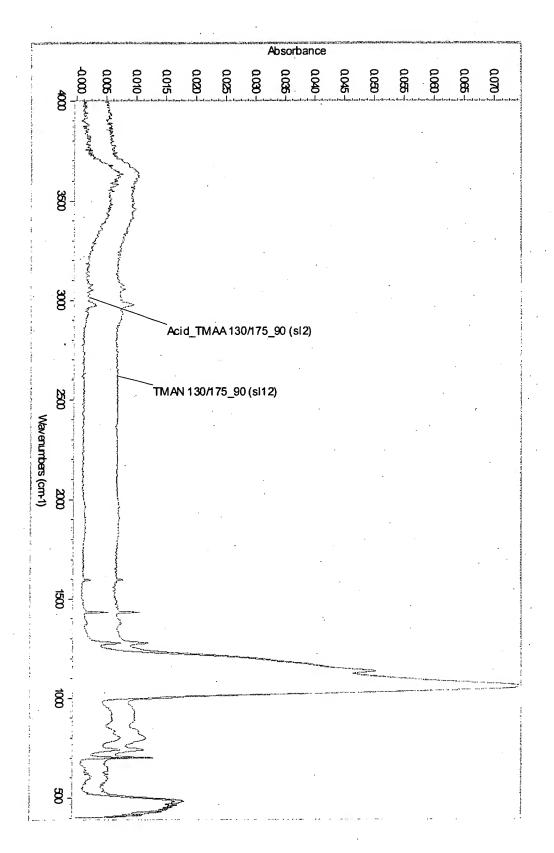


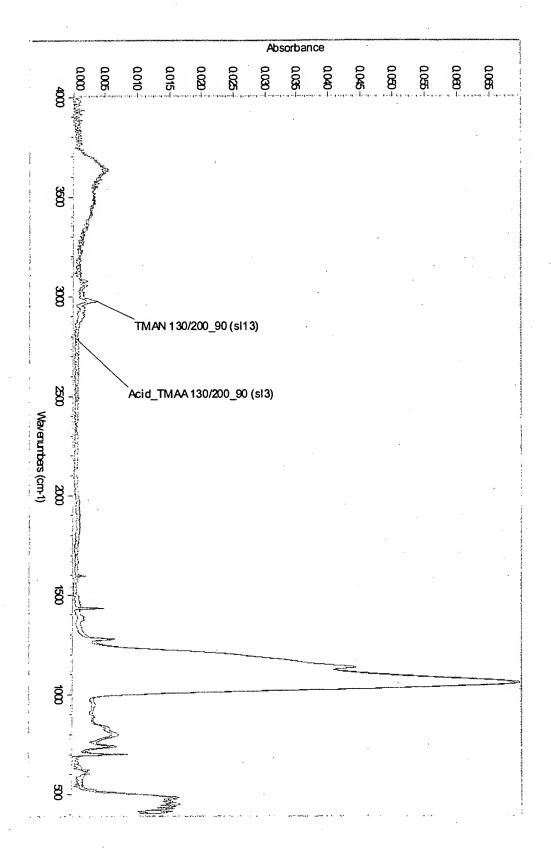


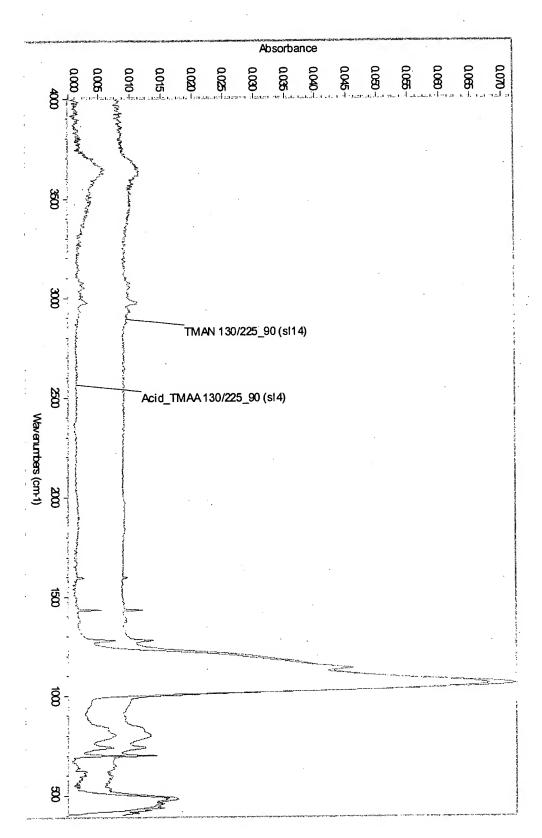


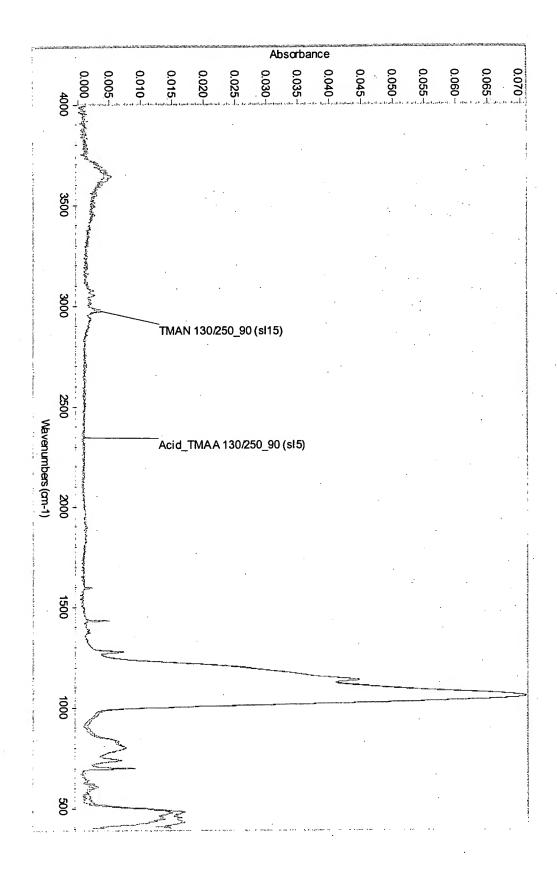


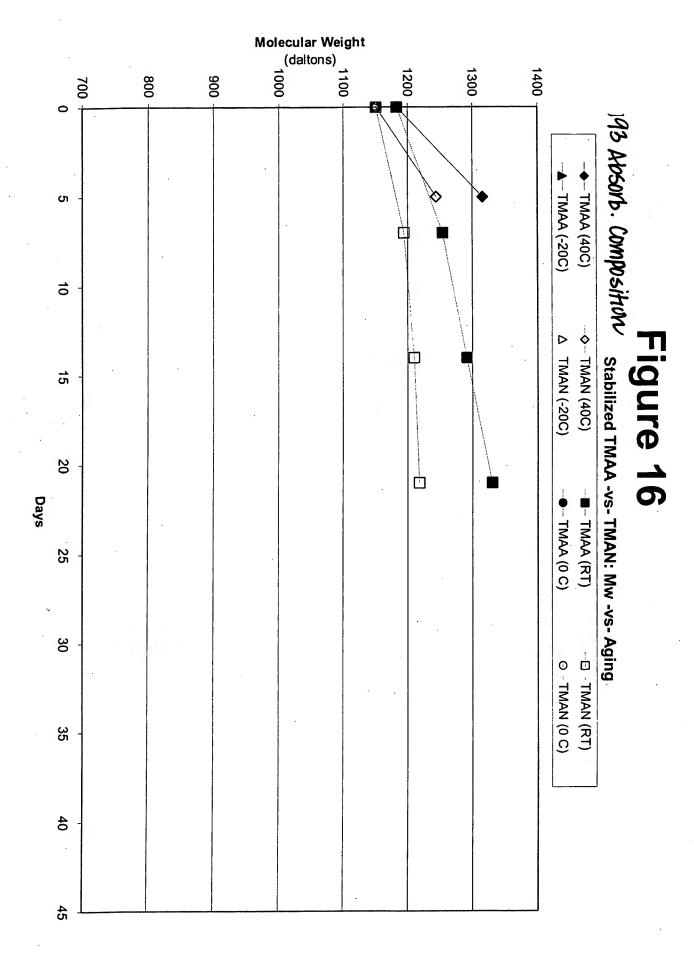


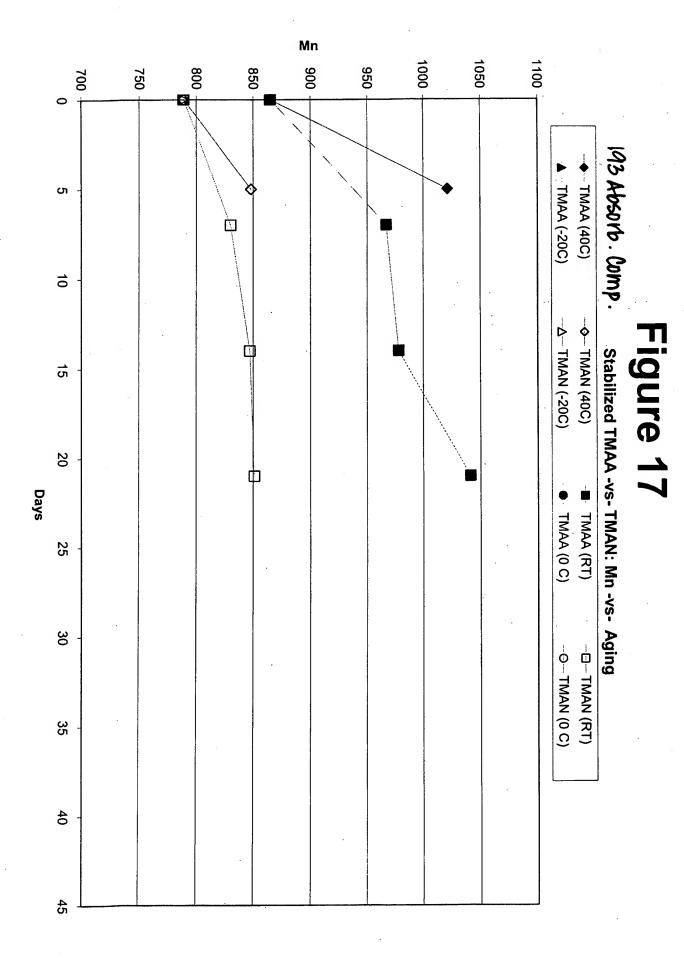












Thickness (angstroms) 1275 1325 1350 1225 1250 1300 1200 193 Absarb. Comp. ► TMAA (-20C) Ŋ 6 Stabilized TMAA -vs- TMAN: Film Thickness -vs- Aging --◇-- TMAN (40C) Δ TMAN (-20C) 5 20 ---- TMAA (0 C) Days 25 30 TMAN (RT) O TMAN (0 C) 35 Spin Speed held constant @ 2000 rpm 40 45

93Ab507b · COMP. Stabilized TMAA -vs- TMAN: Reflectance @ 193nm -vs- Aging ◆ TMAA (40C) ★ TMAA (-20C) 5 6 --♦-- TMAN (40C) --Δ-- TMAN (-20C) Figure 19 ф 5 20 由 TMAA (RT) TMAA (0 C) 25 30 —⊟— TMAN (RT) -- ⊕-- TMAN (0 C) 35 1500 angstroms. Thickness targeted to

Reflectance @ 193nm

0.095

0.09

0.085

0.08

Days

40

45

0.105

0.11

1.81 1.83 1.79 1.82 1.78 1.8 193 Abs. Comp. --◆-- TMÁA (40C) ▲ TMAA (-20C) ဟ Stabilized TMAA -vs- TMAN: Refractive Index @ 193nm -vs- Aging

→ TMAN (40C) ——— TMAA (RT) □ TMAN (RT) 10 △ TMAN (-20C) 5 20 \Box Days ●— TMAA (0 C) 25 30 O TMAN (0 C) 35 1500 angstroms. Thickness targeted to 40 45

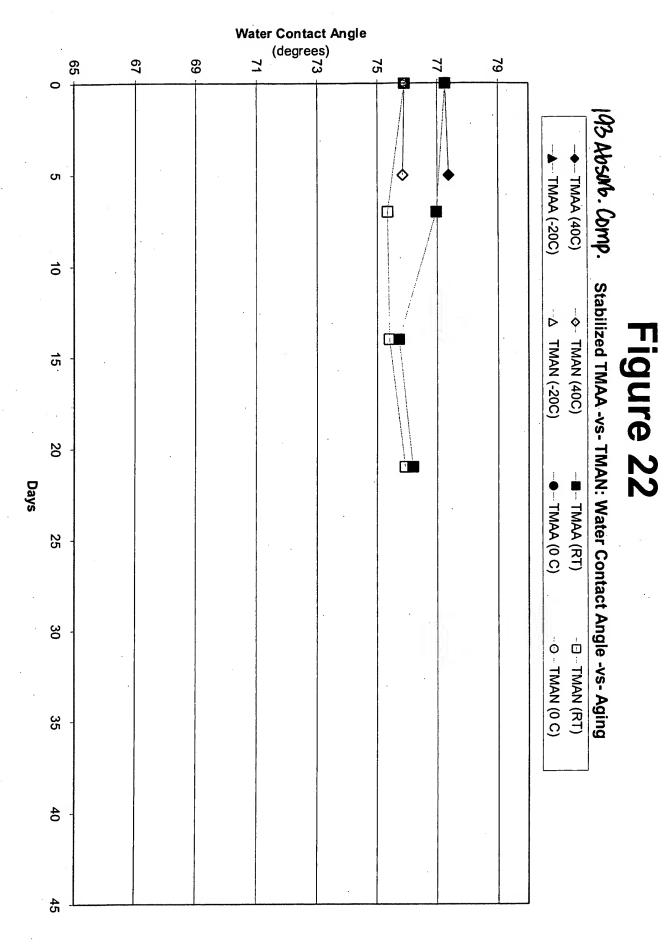
Refractive Index @ 193 nm

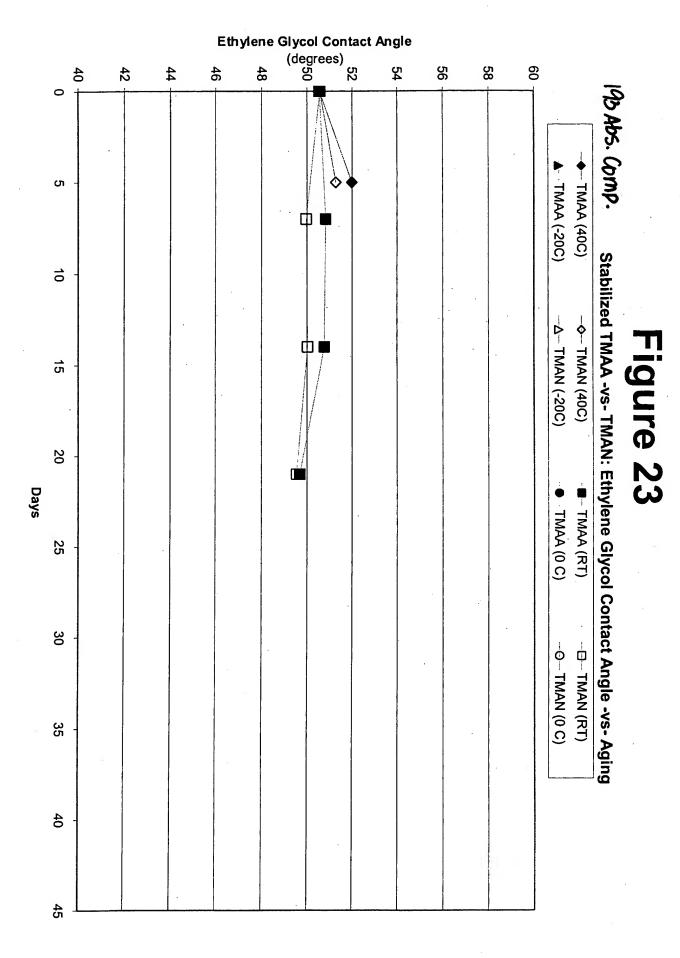
Extinction Coefficient @ 193 nm 0.425 0.375 0.475 193 Absorb. Comp. Stabilized TMAA -vs- TMAN: Extinction Coefficient @ 193nm -vs- Aging 0.275 0.45 0.250.5 0.3 ▲ TMAA (-20C) ഗ 6 -♦- TMAN (40C) _Δ- TMAN (-20C) Figure 21 5 20 ■ TMAA (RT)● TMAA (0 C) 25 8 --⊟-- TMAN (RT) 35 Thickness targeted to 1500 angstroms.

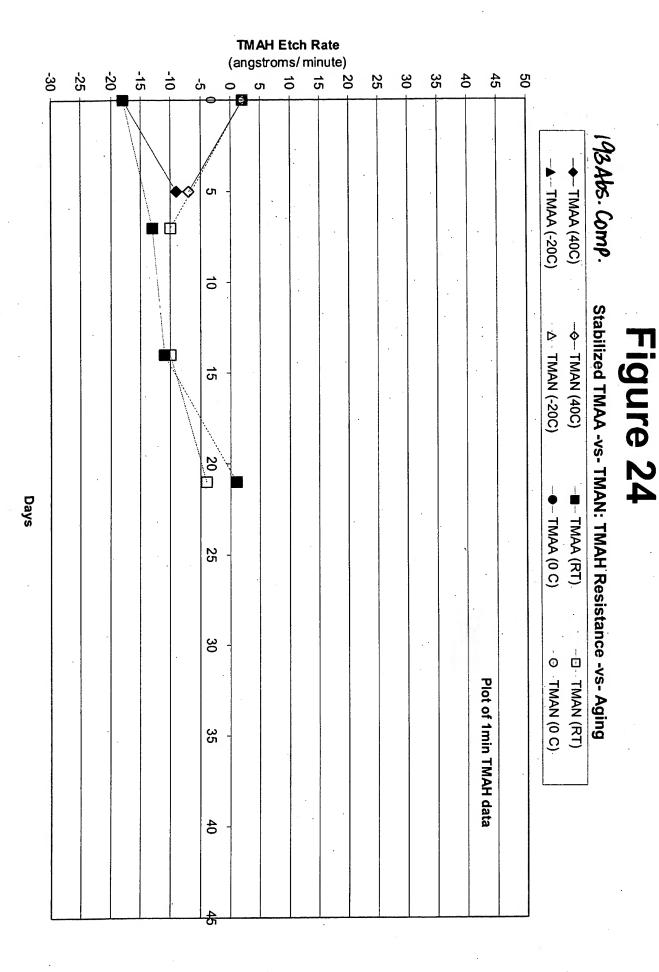
Days

40

45







Buffered Oxide Etch Rate (angstroms/ minute) 30 35 00 00 200 550 600 650 700 750 800 250 100 150 50 198 Abs. Comp. Stabilized TMAA -vs- TMAN: 500:1 BOE strip rate -vs- Aging → TMAA (40C) ▲ TMAA (-20C) G 6 —∆— TMAN (-20C) Figure 25 15 20 Days ■ TMAA (RT) TMAA (0 C) 25 30 --O-- TMAN (0 C) Plot of 1min BOE data 35 40 45

		193 Absorbing	Composition	248 Alos. Comp.
Descriptions		+ 600ppm TMAN	+ 600ppm Stabilized TMAA	!
Hd		1:1	0.5	N/A
Bake temp. (C)/Time (Sec)	(Sec)	130/240C 90sec	130/240C 90sec	130/200C 50sec
DIWater Contact Angle	ngle	78.7	6.87	74.9
Metrics .		ER (A/min)	ER (A/min)	ER (A/min)
	1 m in		6-2	45
2.5% TMAH @ 21°C	2 m in	8.		
	30 sec	263	277	785
500:1BOE @ 21°C	t m in	206		7.6
	2 m in	413	366	720
			~	
DIW ater Contact Angle	ngle	77.5	7.8	74.2
Metrics		ER (A/min)	ER (A/min)	ER (A/min)
7 2 2	1 m is	-10		112
- 1	2 m in	6.		0.6
	30 sec	23.0		() J. () () () () () () () () () (
500:1BOE @ 21°C	1 m in	370	268	7.06
	2 m in	37.0		029100000000000000000000000000000000000
O IWater Contact A	ot Angle	70.2	77.9	7.2
Metrics	2	ER (A/min)	ER (A/min)	ER (A/min)
	1 m in	015		24
2.5% TMAH @ 21°C	2 m in	9		40
	30 sec	223	STATE OF THE STATE	F 10 3.1
500:1BOE @ 21°C	u m in	400	208	964
	2 m in	405		5.555 (ALT7201
DIWater Contact A	ct Angle	5.77	78.3	02
Metrics		ER (A/min)	ER (A/min)	ER (A/min)
1 A AA T	1 m in	# 1		96
7	2 m in			96
	30 sec	26.6	256 P. C.	929
500:1BOE @ 21°C	e E	32.6	# 274 Fig. 274	912
	2 m in	3 4 4 4 4 4 5 1 1 1 2 4 4 4 5 5 1 1 1 2 4 4 4 5 5 5 1 1 1 2 4 4 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	1.1.2. P.C.F.E.[3.1.9.]	[722]

		248 ADS. COMP	193 Aborbing	193 Aborbing composition
Descriptions		ć. ;.	+ 600ppm Stabilized TMAA	+ 600ppm TMAN
Bake temp. (C)		130/200C	130/240C	130/240C
DIW ater Contact Angle	n g le			
Metrics		ER (A/m in)	ER (A/min)	ER (A/min)
(1 m In	29		
2.5% TMAH @ 21-C	2 m in	The state of the s	-2x 2x 3x	
	30 sec	812	158。天皇宗皇宗皇	
500:1BOE @ 21°C	1 m in	8.8.9		252
	2 m in		173	
(30 sec	2.8.3.3 (**)		
NE-14 @ 21 C	1 m in	2.815		
TO THE PERSON OF		the section of the second	The second secon	The state of the s
DIW ater Contact Angl	n g le			
Metrics		ER (A/min)	ER (A/m in)	ER (A/min)
	1 m in			
2.5% TMAH @ 21°C	2 m in	49	The state of the s	
•	30 sec	8.2	1.54	9.61
500:1BOE @ 21°C	1 m in	第12.18	181	303
	2 m in	T. S. O. S. J. S. O. S. J. S. O. S.		3.20 F
	30 sec	。		
NE-14 @ 21 C		> 27.10		
ter extended to the second of		The second of th		
DIW ater Contact Angl	n g le			
Metrics		ER (A/m in)	ER (A/m in)	ER (A/min)
010	1 m in	7.	8. B.	2
2.5% IMAH @ 21 C	2 m in	8.0		
	30 sec	839	165	23.4
500:1BOE @ 21°C	1 m in	7.42	188	Access 2.8.2
	2 m in	9.9	188	315
	30 sec	3040		
NE-14 @ 21 C	1 m in		3	

248 WEAVE OF

193 Absorb. Composition

		APSOND. COMP.	MO Lucadinia de maria de la como	Inpopulation .
Descriptions			+ 600ppm Stabilized TMAA	+ 600ppm TMAN
Bake temp. (C)		130/200C	130/240C	130/240C
DIWater Contact Angle	ngle			
Metrics		ER (A/min)	ER (A/min)	ER (A/min)
20 € 11 € 14 ± 70 ± 0	1 min	23 100	7.2	
2.3% IMAH 優 ZI C	2 min	26		
	30 sec	002		184
500:1BOE @ 21°C	1 min	889	991	253
	2 min	109	168	286
2000 W 17 17	30 sec	- 1732 at		
NE-14 @ 21 C	1 min	> 2825		
	THE REAL PROPERTY AND ADDRESS OF THE PROPERTY ADDRESS OF THE PROPERTY AND ADDRESS OF THE PROPERTY ADDRESS OF THE PROPERTY AND ADDRESS OF THE PROPERTY AND ADDRESS OF THE PROPERTY ADDRESS OF THE PROPERTY ADDRESS OF THE PROPERTY	The state of the s		

		2								
		8	193	93 Absorbing Composition	ing C	ompos	then	(
Desci	Description	248.2100.200m m	A A		•	+ 1070	ppm "optimize	+ 1070ppm "optimized" APTEOS Triflate	riflate	
-	표	N/A	1.5				8			
Rake St	Bake Segmence	130/200 C	130/200°C	130/180 C	130/200°C	⊃ ₀ 00	130/220C	130/240°C	130/250C	130/280C
2	aninaha	50 sec	oes 06				90 sec			
500:1	1 (e)	83	ER	ER	띪	æ	8	85	E	띪
BOE	.20 °C	87/2	89501,888	Leggen	1684	1990		912	# 1884 F. F.	1058J
TMAH		1 min @ ***********************************					33.	The state of		
à	23 °C	99	A.	88	100	186	#		1	The same
2.3% aq.	20 °C	082	100	144	105	(j)	3	4	9.	4
<u> </u>	75 °C	(1636)	187	797	622	446	372		179	129
700 3	23 °C.		9	<u>M</u>	85	-	(Z)		350	0
J.U% dq.	ວ _ິ 0≲ ଼	<i>W</i> ££&	867	347	526	222	123	(4)	₩.	90
	_2° €7	93930	(PATE)	(1002)	68 2	782	624	406	321	211
		SALES CONTRACTOR		A P. Nach Lang	ž.		,		C.La.	* 1
10.0%	ે23 ºC	: E83010	166	196	8	(3)	<i>3</i> .5	(0)	A	16
aq.	. 50 °C	. 93€0	716	992	704	485	294	205	115	ON.
TMAH	75 °C	> 356M	SOUTE CO	(1,683)	(1000)	(A)	006	745	462	332

Desci	Description	248.2100.200mm		Rev A + 1070pp	m "optimized"	Rev A + 1070ppm "optimized" APTEOS Triflate + 1.5% DPG	+ 1.5% DPG
8	pH	NIA	42	<2	42	<2	Q
Ä	Bake	130/200 C	130/180 C	130/200C	130/220C	130/240C	130/260C
Sed	Sednence	50 sec			oes 06		
500:1	1 min @	ER	Æ	H	ER	ER	ER
BOE	20 °C		1.000 F	ं । (०३१म)	[(1989]]		1 (GO)
TMAH	1 min @				TOTAL STREET		
2.5%	.23 °C	32	11/1		Ø.	S	3
ad.	20 0€	66E	98E	. 146 ×	123	300	
ТМАН		ැලන	2607	(4)(E)	00000	290	238
5.0%	23 °C	818	110	(A)	27	765 T	767)
ad.	⊃° 0€	> 35000	626	400	275	333	
TMAH	್ರ-75 ಿ⊂	· · · · · · · · · · · · · · · · · · ·	~ \$.2860	2008	0960	900	958
10.0%	23 °C	9378 G	503	105	99	동	38
ad.	20 0S	: 0098 <	656	400	275	(E)	8
TMAH	_25 °C	JAN S	10000 C	(01/3/6/S)	UGU6 S		

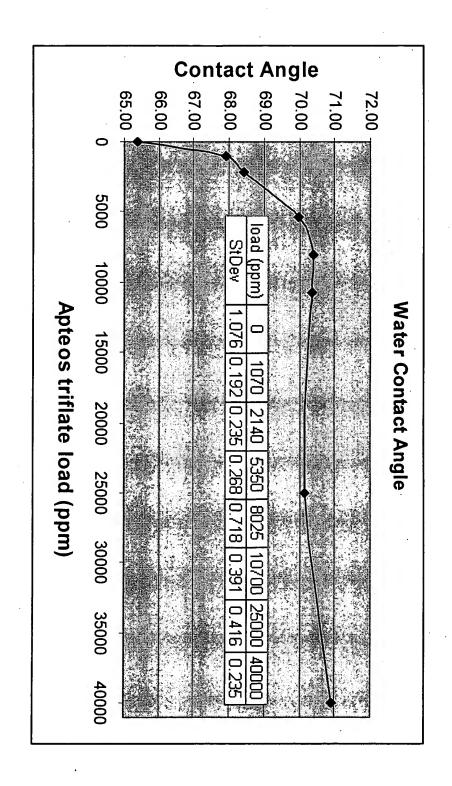
248.2100.200m A +1070ppm "optimized" m A +1070ppm "optimized" m N/A 1.5 <2			Ş	5	193 Absorbing		Composition	2	7	
quence 1.5 <2	Descri	otion	248.2100.200m m			+	070ppm "optimi:	zed" APTEOS M	ISA + 1.5% DPG	
quence 130/200 C 1	H		N/A	1.5	<2	<2	<2	<2	<2	<2
This FR FR FR FR FR FR FR F	Doko Co	9000	130/200 C	130/200°C	130/180 C	130/200°C	130/220C	130/240°C	130/250C	130/280C
1 min	Dave Sel	חבוורב	50 sec	oes 06	oes 06	oes 06	oes 06	oes 06	oes 06	oes 06
20,°C 74.8 [14568] [14369] [14369] 15.0	00:1 BOE		ER	ER	ER	ER	ER	ER	ER	ER
1 min @ 1 min @ 20 20 10 23 °C 60 °C 7 30 10 50 °C 1981 781 11 50 23 °C 1981 781 11 50 23 °C 1981 10 28 1 25 °C 1981 10 28 1 25 °C 10 °C 10 1 1 26 °C 10 °C <t< td=""><td></td><td>1</td><td>872</td><td>[1968]</td><td>[13889]</td><td>0800 · .</td><td>G:8</td><td>-1)08</td><td>008</td><td>99/</td></t<>		1	872	[1968]	[13889]	0800 · .	G:8	-1)08	008	99/
23 °C 10 17 19 18 19	TMAH	1 min @								
50°C T80 T00 T61 S 50 518 S 518 S 518 S 518 S		23 °C		38.	3	286			330	
75°C 1931 781 11/20 507 518 23°C 33°C 38 444 11.5 78 50°C 5.5520 29.8 444 11.5 78 75°C 5.5520 4212 52880 695 686 75°C 5.5520 716 30 30 50°C 5.5530 716 30 30 50°C 5.5530 716 906 387 168	2.3% aq.	ට ₀ 09		000		(36)	eş.	9	<i>3</i> (0)	11
23°C S.		_75 °C		787		202	518	2001	242	226
aq. 50°C 850°C 10 28 4 AH 75°C 8450°C 208 444 715°C 78 AH 75°C 8450°C 100°C 8280°C 695°C 860°C AH 50°C 8450°C 716°C 906°C 30°C AH 57°C 8580°C 716°C 30°C									AND AUTOMOSINESS.	
add. 50°Cc S6522 298 4115 78 14 75°Cc >3566 (Ø12) >2889 695 686 23°Cc S6500 716 91 20 32 14 50°C S6500 716 906 387 716		23 °C.		Ŗ	30	(A)	\$	1.5	(2)	<i>0</i> 11
759Cal > 2580 695 686 193 col 106 20 20 30 194 col 259C 26 30 30 194 col 259C 26 30 30 194 col 259C 26 30 30 195 col 255C 26 30 30 195 col 255C 26 30 30 195 col 255C 26 27 27 195 col 255C 26 27 27 195 col 27 26 27 27 195 col 27 26 27 27 195 col 27 27 27 27 195 col 27	5.0% aq.	.20 °C				391);	9	9	88	9
23.9C \$650.0 \$0.0 \$2.5		ე ₀ ၄/	£84 1988	शब्दाह्य		969	989	37.2	466	283
23 ° C 25 ° C 32 32 32 32 32 33 32 33		2.4						Day Side		
50.0C >3.53.0 7.16 906 387. 168 168 159.0C	,00	23 °C				250		ල	P	23
Section 1947 EARLY STANDS STANDS SECTION SECTION	10.0% aq. Trasi	− 20 °C		9/2	906	282		R	282	(i)
		-75 °C	W1033	(0)1874 S	1000 4 ·	Control of the contro	7/1/20	746	≻ 0 26	513

	19	31	Hos	SÓY	Ь.	Co	m). 	
1.5% DPG	1070 ppm apteos msa +	Rev A +	triflate + 1.5% DPG	1070 ppm "opt" apteos	Rev A +	triflate	1070 ppm "opt" apteos	Rev A +	Materials

			:			ar .
۵		۵		1.732		. Pg
7	0	7	0	טז	0	Days at 40C
1006	880	1058	891	1062	780	Mn
1410	1241	1486	1269	1568	. 1109	Mw
1175	749	1198	754	1329	735	Мр
1887	1680	1995	1722	2188	1488	Mz
2364	2127	2520	2179	2853	1844	M ₂₊₁
1.402	1.41	1.404	1.424	1.476	1.422	PDI

	No voiding	1641	1289	nitric acid acidified TMAA
101				pH1.5 + 2000ppm
	110 nm via fill	Mw	Mn	5 days at 400 / 193AO

		5		[93	Ab sor bing		COMPOSI FLOW (AC)	N CAC.		
Desc	Description	248.2100.200 mm	1.5	Rev A	pH 5.5	Rev A + 1070ppm APTEOS Nitrate	APTEOS Nitrate + APTEOS Nitrate + 3% DPG + 3% DPG	Rev A + 1070ppm APTEOS Nitrate + 3% DPG	Rev A + 1070ppm APTEOS Nitrate + 6% DPG	Aev A + 1070ppm APTEOS Nitrate + 9% DPG
	표	NA	1.5	2	5.5	<2	4	<2	7>	<2
ď	Bake	130/200 C	130/2	130/200°C	130/240 C			130/240 C	j.	
Seq	Sequence	50 sec N2	90 sec N2	c N2	60 sec N2			90 sec N2		
500:1	1 min @	ER			ER	æ	æ	ER	æ	ER
BOE	20 °C	679		[1568]	612	422	[985]		189	2. 979
TMAH	1 min @	12.7	Pre	ER						
2.5%	23 °C	(X)	2694	-		(S)			\$	
ad.	50 °C	525	2663	100	7.	3 7	٥		9	9
TMAH	75°C		2702	781	142	117	996	224		463
) O O	- 23 GP	587	2670	PANALES	6.70	U Kasasa		Name of Contract of		
ag.	2 ₀ 05	4	2723	298		70			170	(8)
TMAH	75 °C		2699	** . : 1212	339	119	208	259	524	922
100		1000	P		STATE OF THE PARTY		A SALE AND	Control of the Contro	A STATE OF THE PARTY OF THE PAR	
10.0%	23 °C	55,04,641;65	2687	166			X			
ad.	−20 °C	\$\$ \$2.5.3469 pm	2670	716	142			106	Ē,	03
TMAH	ე₀ <i>5</i> 2	2,35/14	2706	3.7706	859	219	11040	546	5.41075	(AST (573)



193	Ab	ov b	ın	9	C	on	ηP	•	
: ∴ 193 Rev A + 40000 ppm APTEOS Triflate	. 193 Rev A + 25000 ppm APTEOS Triflate	193 Rev A + 10700 ppm APTEOS Triflate	193 Rev A + 8025 ppm APTEOS Triflate	193 Rev A + 5350 ppm APTEOS Triflate	: 193 Rev A + 2140 ppm APTEOS Triflate	. 193 Rev A + 1070 ppm APTEOS Triflate	193 Rev A	Description	
1533	1500	1506	1512	1509	1514	1:502	1469	Thickness	
10.5	12.2	12.7	9.7	15.4	12.1	15.4	12.2	1 dev	
10.16	10.14	10.15	10.19	10.18	10.33	10.26	9.77	@ 193nm	Reflectance
1.7793	1.7998	1.7958	1.7918	1.7931	1.7945	1.8019	1.8027	n @ 193nm	
0.3276	0.3526	0.3427	0.3329	0.3362	0.3304	0.3469	0.3811	k @ 193nm	

			•	A de la la servicio de companya de la seculta de proposition de la seculta de la secul			
ppm APTEOS Triflate	40C Aging	Mn	Μw	dW.	Mz	Mz+1	Polydispersity
193 + 1070ppm APTEOS Triflate	0	920	. 1283	759	1724	2173	
	5	1279	1681	1405	2174	2706	1.314284
193 + 2140 ppm APTEOS Triflate	0	754	1119	744	1562	2000	1.483957
	5	955	1378	788	1897	2455	1.442483
7 193 + 5350 ppm APTEOS Triflate	0	928	1226	754	1640	2046	1.39940
	5	984	1367	6//	1819	2268	1.38917
7 193 + 8025 ppm APTEOS Triflate	0	877	1228	754	1646	2058	1.40051
	5	886	1369	1112	1812	2247	1.38518
.193 + 10700 ppm APTEOS Triflate	0	875	1226	755	1642	2052	1.40143
	5	1001	1396	1156	1860	2320	1.39492
193 + 25000 ppm APTEOS Triflate	0 .	846	1204	764	1635	2060	1.42421
	5						
193 + 40000 ppm APTEOS Triflate	0	835	1169	755	1558	1930	1.39928
	5	846	1260	773	1726	2168	1.489298

193 Absorb. Comp.

	:	1248 RC	193 Absu	93 Absurbing Compos	mposition
Description	iption	248.2100.200mm	. Rev A	Rev A + 10,700 ppm APTEOS Triflate (10X)	APTEOS Triflate (37X)
ΡĦ	I	NIA		<2.5	<2.5
Bake	κ̄ο	130/200 C	130/200 C	130/	130/240 C
Sequence	ence	50 sec N2	90 sec N2	90 s	90 sec N2
500:1	1 min @	ER	贸	穷	ER
BOE	∵20 °C	750	[16 <u>68</u>]	7776	Lapti 1
TMAH	1 min @			が、近くなどのできないなどのできない。	
2.5%	23 °C	35	67	22	48.4
aq.	50°C	493	100	8	95
TMAH	75 °C	1488	781	334	[2252]
5 Nº/	23 °C	287		25	9-
	್ರಾ 05	J 1604 J	298	69	809
TMAH	. 2º 57∵	[2639]	12/2 (1/2) (909	2709
Safe, Ask		(4) (1) (2) (2) (2) (3) (4) (4) (4) (4) (4) (4) (4) (4) (4) (4			
10.0%	∵23 °C	>3491	166	8	
aq.	50 °C	> 3427/	716	162	878
TMAH	. 2º c	75 °C	90.6		

